BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional view taken from the side elevation of a masonry fireplace embodying the present invention;

FIG. 2 is a front view of the fireplace of FIG. 1;

FIG. 3 is a detail view of a portion of FIGS. 1 and 2;

FIG. 4 is a perspective view of an alternative embodiment of a fireplace which is of masonry type construction; and

FIG. 5 is a cross-sectional view of a free standing fireplace illustrating yet another embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring generally to FIGS. 1, 2 and 3 the heating unit of the present invention includes fire box means 10 which has a rectangular glass door which is substantially air impervious but of course transmits both heat and light from the fire indicated at 12. The door is hinged at the bottom at pivot axis 13 and is slightly ajar from the front wall 16 of the fireplace leaving for example a ½ inch to ¾ inch opening at the top of the door. In addition door 11 overlaps the top edge 16 of the rectangular fireplace opening approximately ¼ inch to ⅜ inch. This overlap is best shown in FIG. 2 which illustrates that the overlap occurs on both the top edge 16 of the fireplace and the sides 17 and 18. The pivot axis 13 of the door 11 is a predetermined distance 21 from the fireplace floor 19 and in the preferred embodiment this distance is approximately four inches.

Thus the glass door 11 in conjunction with the front wall 15 of the fireplace forms vent means in proximity to the top edge 16 of the fire box which because of the overlap admits air having a velocity vector which is substantially vertical downward along the window vanes. This vector is shown at 22. More particularly the vent means includes the horizontal slit formed by the upper portion of door 11 with the top edge 16 together with the side openings of the door as indicated at 23 which provide wedge shaped openings to allow some air to enter the sides of the fire box.

From a theoretical standpoint it is believed that air entering at the top of the glass door has more velocity than that entering at the sides. This therefore tends to bend the side air downwards and outwards from the glass, thus breaking up any rolling air and keeping the vertical edges of the glass clean. Because of the overlap at the edges of the fireplace opening and especially the top overlap and the greater effective area of opening at the top of the glass door, most of the air enters at the top with a smaller amount at the sides. This top entering air has a velocity vector substantially vertically downward along the interior of the glass door 11 to provide a cool curtain of air.

In accordance with the above theory the bottom of the door below its pivot axis 13 must be securely sealed against air leaks since it is believed that any tiny air whirl at the bottom corners would be deleterious to the vertical air curtain of the fireplace. The offset 21 of the axis 13 from the bottom 19 of the fireplace eliminates this effect.

It is also preferred that the flue opening be at the back of the fireplace since this tends to draw the smoke and gases away from the glass door. An eight inch flue is believed to provide a faster lift and a better balance with the very small amount of air that will enter the fireplace through the vents provided.

In order to properly initiate a good draft, door 11 must be opened ten to twelve inches until the fire has properly heated the fire box chamber 10.
3,616,788

The details of the pivot 13 along with a means for adjusting the opening of the glass door with respect to the fireplace wall is illustrated in FIG. 3. The pivot is of the lift off type and includes a horizontal rod 24 which is spaced from bottom 19 of the fireplace by a vertical support means 26. The support means 26 also provides an air tight seal from the base of the fireplace to the pivot point. The rotary part of the pivot includes an arcuate portion 25 fastened to the base of door 11 which is adapted for rotation on the rod 24.

The means for adjusting the top opening slit and the tapered side slits formed by the door is indicated generally at 27. They include a stud 28 extending from the top end of door 11 which meshes with one of the teeth 29 of catch 30 which is pivoted at 31 on the front fireplace wall 15. The various teeth 29 may be used to adjust the spacing of door 11 from the rectangular aperture to provide the proper draft. Finally a chain 33 couples the door to the wall 15 to allow for a wider opening for placing wood in the fire box, etc.

FIG. 4 shows an alternative embodiment of the invention which has double glass doors 40 and 41 which are hinged to vertical portions of rectangular frame 42. The frame includes a top slit portion 43 and wedge shaped or tapered side air intakes 44 and 46. As was true with the fireplace of FIGS. 1 and 2 the air intakes overlap the rectangular aperture 47 to provide the proper vertical air vector.

Other types of glass doors may of course be used including sliding and French type. Also it is apparent that upper and side draft air intakes may be adjustable.

The embodiment of FIG. 5 shows either a cylindrical or square refractory fire box 50 having a refractory fire bowl 51 with glass panels and side windows 52. A top sealing plate 53 seals the fire box 50 and provides support for the funnel 54 which tapers into the chimney unit 56. Funnel 54 includes a spreader unit 57.

Top plate 53 includes apertures 58 which may be in the form of circular holes to allow air to enter with a vector shown at 59 to provide a vertical curtain of air against the windows 52 which extends down past the windows into the fire bowl 51 and then up into the funnel 54.

It is believed that in the embodiment of FIG. 5 the top location of the plate 53 with its apertures 58 provides a proper vertical air vector without need of any overlap.

Thus the present invention provides an improved fireplace especially useful with glass type windows or doors where the input air vents provide a cool curtain of air across the glass windows to keep them smokeless and cool. This provides a fireplace which is esthetically pleasing, has good combustion qualities and provides a reasonable amount of heating.

What is claimed is:

1. A heating unit comprising fire box means including substantially air impervious light transmitting window means as a portion of its wall, vent means in proximity to the top of said fire box to admit air thereto said vent means having a configuration so the velocity vector of entering air is substantially downward along said window means, said vent means being substantially the only means for air to enter said fire box said vent means including a horizontal slit near the top of said fire box means where most of said air enters.

2. A heating unit as in claim 1 where said vent means is formed by an overlap of said window means with another portion of said fire box.

3. A heating unit as in claim 2 where said horizontal slit is formed by the top of said window means and said vent means also includes wedge-shaped openings formed by the side of said window means.

4. A heating unit as in claim 1 where said window means is the entrance door to said fire box together with means for spacing the upper portion of said door away from the wall of said fire box to provide said slit for admitting air with said velocity vector.

5. A heating unit as in claim 1 where said fire box includes a rectangular aperture said window means closing said aperture and being pivoted at the bottom of said aperture to provide said slit at the top of said aperture to allow the entrance of air with said velocity vector.

6. A heating unit as in claim 5 together with means coupled to said window means for adjusting the width of said slit.

7. A heating unit as in claim 5 wherein said window means is of the same configuration as said rectangular aperture but slightly larger to provide an overlap around said aperture.

8. A heating unit as in claim 6 in combination with pivot means for said window means including a horizontal rod fastened to the base of said fire box and an arcuate portion extending from said window means which is adapted for rotation on said rod.

9. A heating unit as in claim 1 wherein said fire box includes a rectangular aperture with a frame having slits proximate to the top and upper parts of the sides to admit air to said fire box said window means including a pair of doors pivoted on the sides of said frame to allow said door to swing in a substantially horizontal arc.

10. A heating unit comprising fire box means including substantially air impervious light transmitting window means as a portion of its wall, vent means in proximity to the top of said fire box to admit air thereto said vent means having a configuration so the velocity vector of entering air is substantially downward along said window means, said vent means being substantially the only means for air to enter said fire box, said fire box including a top sealing plate for receiving a chimney and holes around its periphery in proximity to said window means for allowing air to enter with said velocity vector.

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U.S. Cl. X.R.

126—140, 202